

REMARKS

Claims 1-10 are pending in the instant application. Claim 10 is withdrawn from consideration as directed to non-elected subject matter that was subject to a Restriction Requirement. No claims are currently amended, added, or cancelled. As set forth in prior Responses, the Applicants maintain the traversal of the restriction requirement for purposes of preserving the right to petition the Examiner's decision until after final action on or allowance of claims to the invention elected.

Claims 1-9 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Miyajima et al. (U.S. Pre-Grant Pub. No. 2002/0015748) in view of Lee et al. (European Patent Pub. No. 0997498). The Applicants respectfully continue to traverse the rejection of claims 1-9 under 35 U.S.C. §103(a) over Miyajima et al. in view of Lee et al. on the basis that the Examiner has failed to properly establish that every element of independent claim 1 is taught by the combination of Miyajima et al. and Lee et al., and that the Examiner has failed to properly establish obviousness through optimization of a known result-effective variable such that one of skill in the art would **not reasonably have been expected** to practice the invention claimed in independent claim 1 based upon the combined teachings of Miyajima et al. and Lee et al.

As to the New Rejections of Claims 1-9 Under 35 U.S.C. §103(a) Over Miyajima et al. in View of Lee et al. That Rely Upon Principles of Obvious Optimization of a Known Result-Effective Variable

As set forth to above, the Applicants respectfully traverse the rejection of claims 1-9 under 35 U.S.C. §103(a) over Miyajima et al. in view of Lee et al. In particular, the

Applicants respectfully submit that the Examiner has failed to establish that Miyajima et al. and Lee et al. teach every element of independent claim 1, and that the Examiner has improperly relied upon the doctrine of obvious optimization of a known result-effective variable to establish the instant rejections. As such, the Applicants respectfully submit that the instant rejections of claims 1-9 under 35 U.S.C. §103(a) must be withdrawn.

The Applicants again take the position that the combined teachings of Miyajima et al. and Lee et al. fail to teach a method, as claimed, wherein a time interval from the moment directly after measurement of a torque of the curable liquid silicone composition at the molding temperature to the moment when the torque reached 1 kgf•cm is not less than 1 min., while the time interval during which the torque grows from 1 kgf•cm to 5 kgf•cm is not more than 1 min. As the Examiner is aware, the time it takes for the torques to grow from 1 kgf•cm to 5 kgf•cm is not only dependent upon the composition, but is also attributable to processing parameters (such as the temperature at which the composition is cured). The very same silicone composition can exhibit different periods of time for which torque grows from 1 kgf•cm to 5 kgf•cm depending upon the processing parameters (see curable liquid silicone rubber compositions (A)-(D) in Table 1 on page 15 of the original application as filed, in which different times to the specified torques are achieved based upon different curing temperatures for the very same compositions). As such, the instant case pertains to discovery of **previously unidentified** curing parameters of a curable liquid silicone composition that, when employed in a method of sealing a semiconductor device, produce unexpected results relative to sealing the semiconductor device. In particular, the combination of viscosity of the curable silicone

composition, time to achieve a torque of 1 kgf*cm during curing, and time to achieve a torque of 5 kgf*cm during curing affect the formation of voids (manifested in appearance of the cured silicone composition), fillability, and warping of the semiconductor that is encapsulated with the cured silicone composition.

The Examiner has recognized the failure of the combined teachings of Miyajima et al. and Lee et al. to teach the above-summarized features of claim 1 relative to the specified time intervals for the torque of the curable liquid silicone composition to grow. The Examiner has taken a position that the time interval required for a silicone sample to go from one torque to another torque is dependent on cure temperature and the silicone composition, which the Applicants do not contest. However, the Applicants dispute the Examiner's conclusory statement in which it is indicated that "[t]herefore, this is a result effective variable" such that "it would have been obvious to one having ordinary skill in the art at the time of the invention to have conducted routine experimentation to determine the optimum time interval required for a silicone sample to go from one torque to another torque in order to obtain the desired cure temperature and the silicone composition." The Applicants respectfully submit that the Examiner's position fails to reflect a proper analysis under the doctrine of obvious optimization of a known result-effective variable.

The Applicants recognize that optimization of known result-effective variables can provide a basis for establishing *prima facie* obviousness under some circumstances. Referring to MPEP 2144.05, "[g]enerally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating

such concentration or temperature is critical”. Indeed, “**where the general conditions of a claim are disclosed in the prior art**, it is not inventive to discover the optimum or workable ranges by routine experimentation.” (Emphasis added, see MPEP 2144.05(IL)(A.). However, referring to MPEP 2144.05(B.), “[a] **particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result**, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation.” (Emphasis added, citing *In re Antonie*, 559 F.2d 618). As such, a key focus of the “routine optimization” analysis is whether there is a **recognition in the art that the variable to be optimized achieves a recognized result**, and it cannot be determined that optimization would be routine until a recognized result to be achieved is identified.

As made clear through the foregoing references to the MPEP, it is imperative that the optimization analysis be tied to a particular result achieved by the variable at issue, and a proper analysis must explain why it would be routine to optimize the variable to arrive within the confines of the claimed range at issue. After all, if the prior art teaches or suggests a beneficial result that is attributable to higher amounts of a given component, it clearly cannot be concluded that one of skill in the art would include lower amounts of the component outside of the disclosed range in the prior art to “optimize” the amount of the component.

In the instant rejections, the Applicants respectfully submit that the Examiner has failed to properly account for the claimed times that it takes for the silicone composition to grow from 1 kgf•cm to 5 kgf•cm as specified in independent claim 1. The Examiner’s apparent reasoning is that since that cure temperature and silicone composition are result-effective variables, a

specified time interval for a silicone composition to go from one torque to another torque is also a result-effective variable because such a variable is dependent upon cure temperature and silicone composition. However, the Applicants note that the time interval for a silicone composition to go from one torque to another torque **is dependent upon more than one reaction variable, the connection between which is not recognized within either Miyajima et al. or Lee et al.** The mere fact that cure temperature and silicone composition may, by themselves, be result-effective variables is wholly insufficient to establish that a person of skill in the art would be taught to optimize the silicone composition **and** the cure temperature **together**, as would be necessary to optimize time interval for a silicone composition to go from one torque to another torque. For a person of skill in the art to be expected to optimize silicone composition and cure temperature together, it would at least be necessary for such a person to recognize *some result* that is controlled by the combination of silicone composition and cure temperature. The Examiner has provided no evidence to prove that those of skill in the art would recognize a particular result that could be optimized based upon selection of silicone composition and cure temperature.

Notably, the instant scenario is very similar to the scenario at issue in the case of *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977), **which is explicitly noted in MPEP 2144.05(II)(B.) as a scenario in which a particular variable was not recognized as a result-effective variable in the art.** Citing MPEP 2144.05(II)(B.) in regards to *In re Antonie*, “the claimed wastewater treatment device had a tank volume to contractor area of 0.12 gal./sq. ft. The prior art did not recognize that treatment capacity is a function of the tank volume to

contractor ratio, and therefore the parameter optimized was not recognized in the art to be a result-effective variable.” Certainly, it could be said that a volume of the tank at issue in *In re Antonie* could be a result-effective variable, with volume optimizable to configure the tank to fit in a desired space or to hold a desired amount of fluid. However, the measurement of tank volume to contractor ratio itself was not recognized as a result-effective variable, even though such a ratio depends upon a combination of variables that, by themselves, could be considered to be result-effective and subject to optimization. Similarly, even though cure temperature or silicone composition could feasibly be deemed result-effective variables *by themselves*, there is absolutely no recognition in the art of significance of the time interval for a silicone composition to go from one torque to another torque such that, like the situation in *In re Antonie*, it is improper for the Examiner to rely upon the doctrine of obvious optimization to reject the instant claims.

In view of the foregoing, the Applicants respectfully submit that the Examiner has failed to properly establish obviousness of independent claim 1 over Miyajima et al. in view of Lee et al. due to the failure to properly account for a teaching of the instantly claimed times to grow torque of the silicone composition from 1 kgf•cm to 5 kgf•cm in the prior art, and due to lack of recognition in the art that the time interval for a silicone composition to go from one torque to another torque is a result-effective variable. As such, the Applicants respectfully submit that the rejection of claims 1-9 under 35 U.S.C. §103(a) over Miyajima et al. in view of Lee et al. is overcome and must be withdrawn. The Applicants further submit that the claimed combination of viscosity of the silicone composition and specified

time to grow torques from 1 kgf•cm to 5 kgf•cm provide significant unexpected results (as illustrated in Table 2 on page 17 of the original application).

The Applicants respectfully submit that independent claims 1-9 are in condition for allowance, which allowance is respectfully requested. This Response is being filed with the appropriate fee for a one-month extension of time and it is believed that no further fees are presently due. However, the Commissioner is hereby authorized to charge any additional fees or credit any overpayments to the undersigned's deposit account 08-2789.

Respectfully submitted,

HOWARD & HOWARD ATTORNEYS, PLLC

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/Christopher S. Andrzejak/
Christopher S. Andrzejak, Registration No. 57,212
450 West Fourth Street
Royal Oak, MI 48067-2557
(248) 723-0438